JUL 16 2004
PATENT & TRADEMARK OFFICE

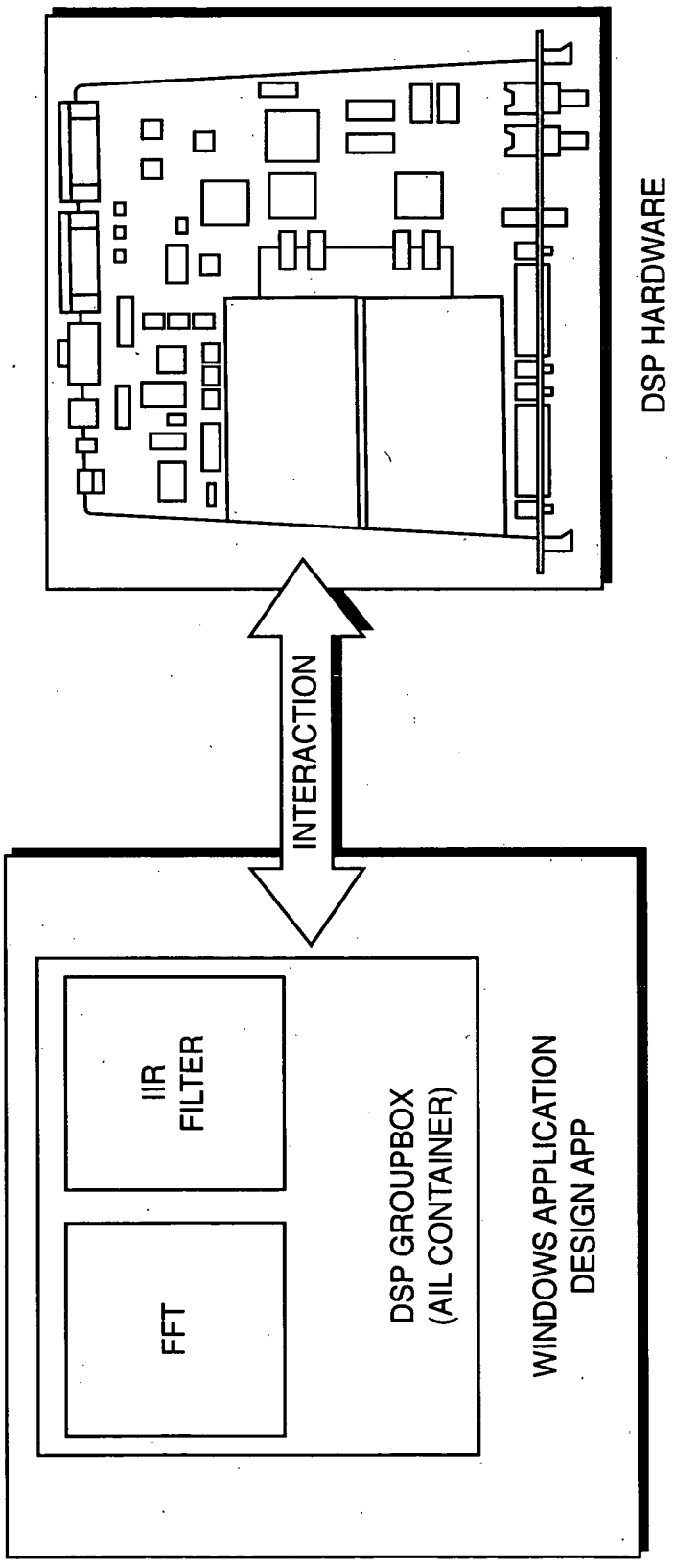


FIG. 1

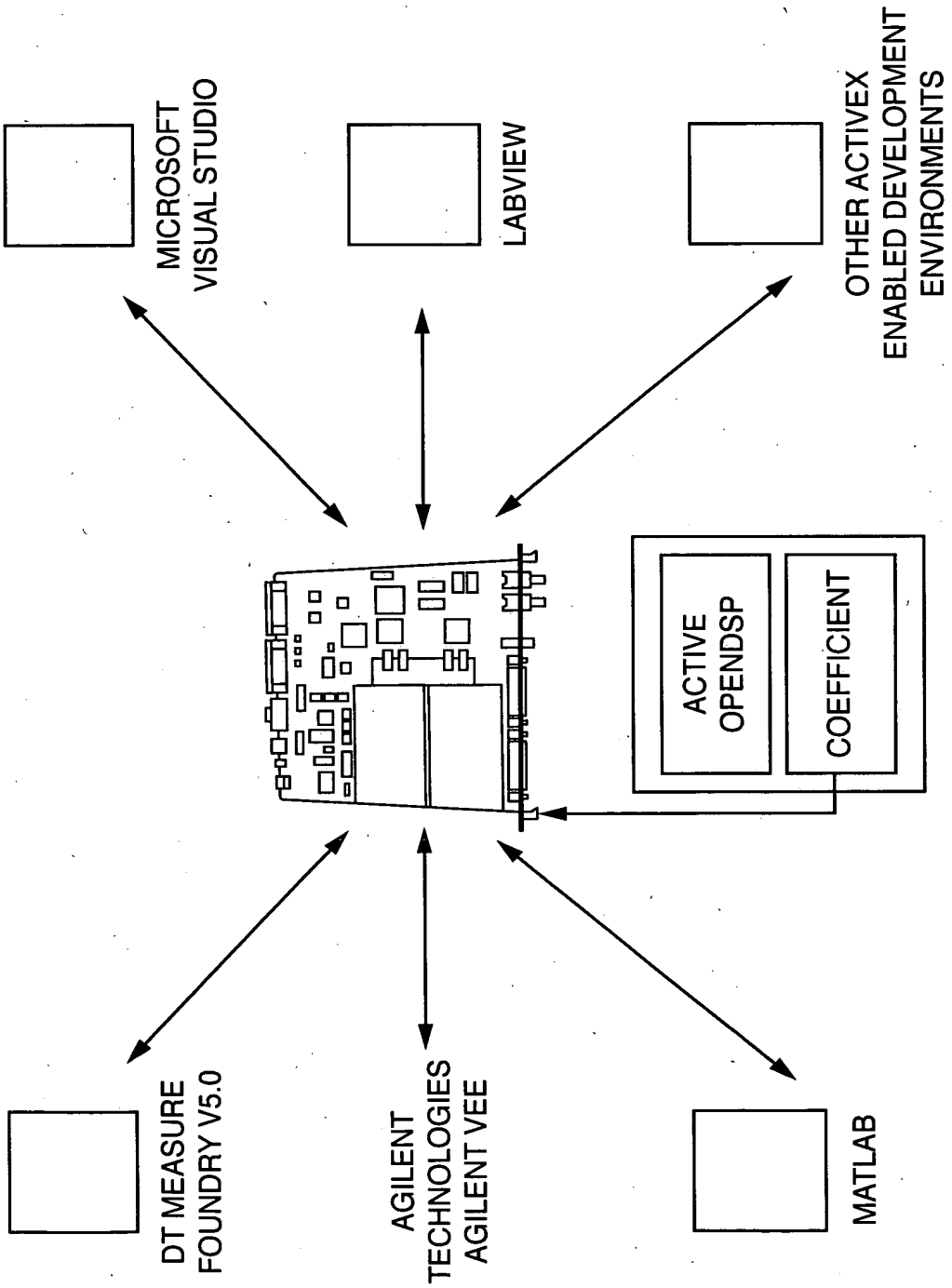

MICROSOFT VISUAL STUDIO
LABVIEW
OTHER ACTIVEX ENABLED DEVELOPMENT ENVIRONMENTS
ACTIVE OPENDSP
COEFFICIENT
DT MEASURE FOUNDRY V5.0
AGILENT TECHNOLOGIES AGILENT VEE
MATLAB

FIG. 2

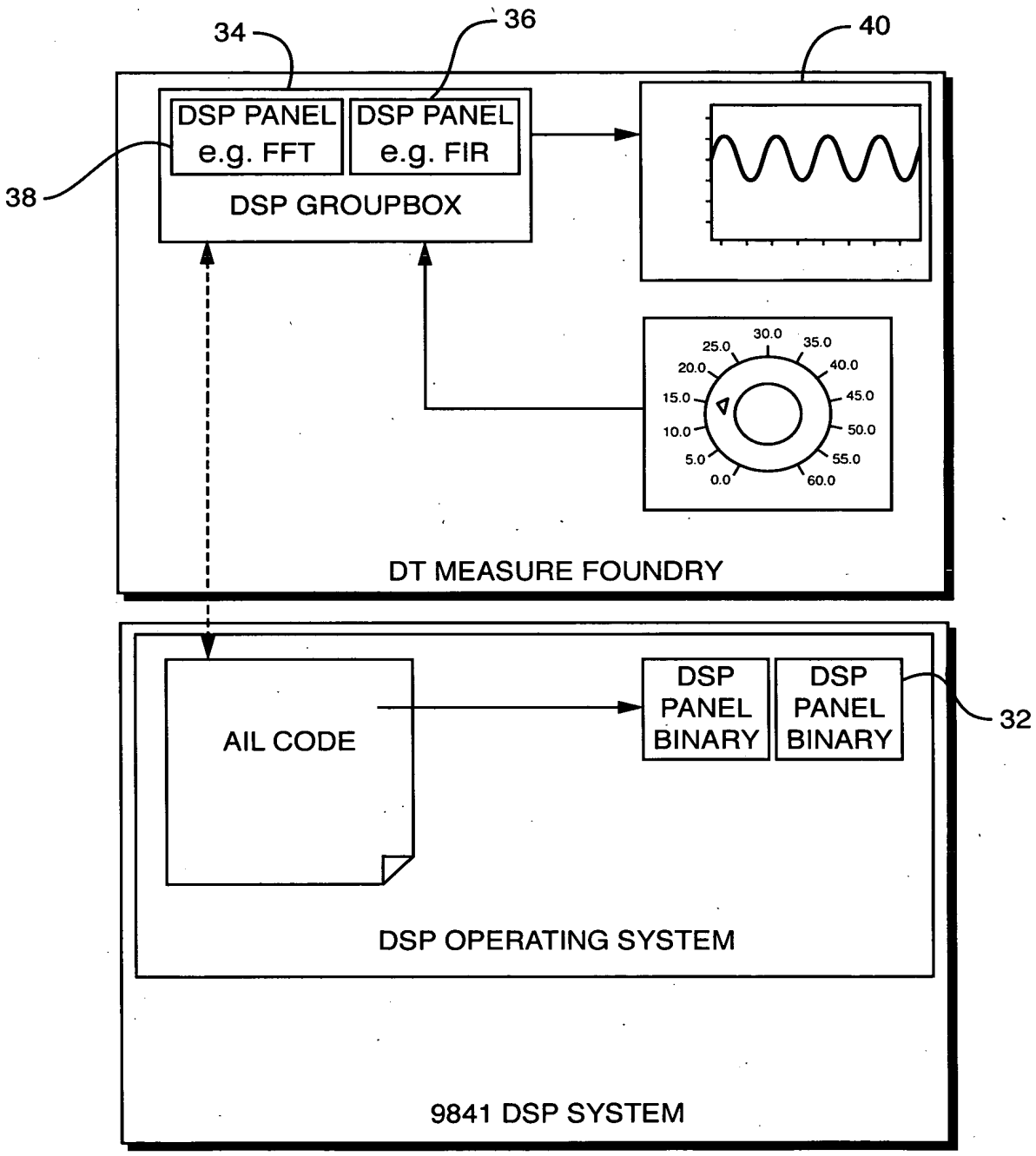

34
36
40
38
DSP PANEL
e.g. FFT
DSP PANEL
e.g. FIR
DSP GROUPBOX
30.0
25.0
35.0
20.0
40.0
15.0
45.0
10.0
50.0
5.0
55.0
0.0
60.0
DT MEASURE FOUNDRY
AIL CODE
DSP
PANEL
BINARY
DSP
PANEL
BINARY
32
DSP OPERATING SYSTEM
9841 DSP SYSTEM

FIG. 3

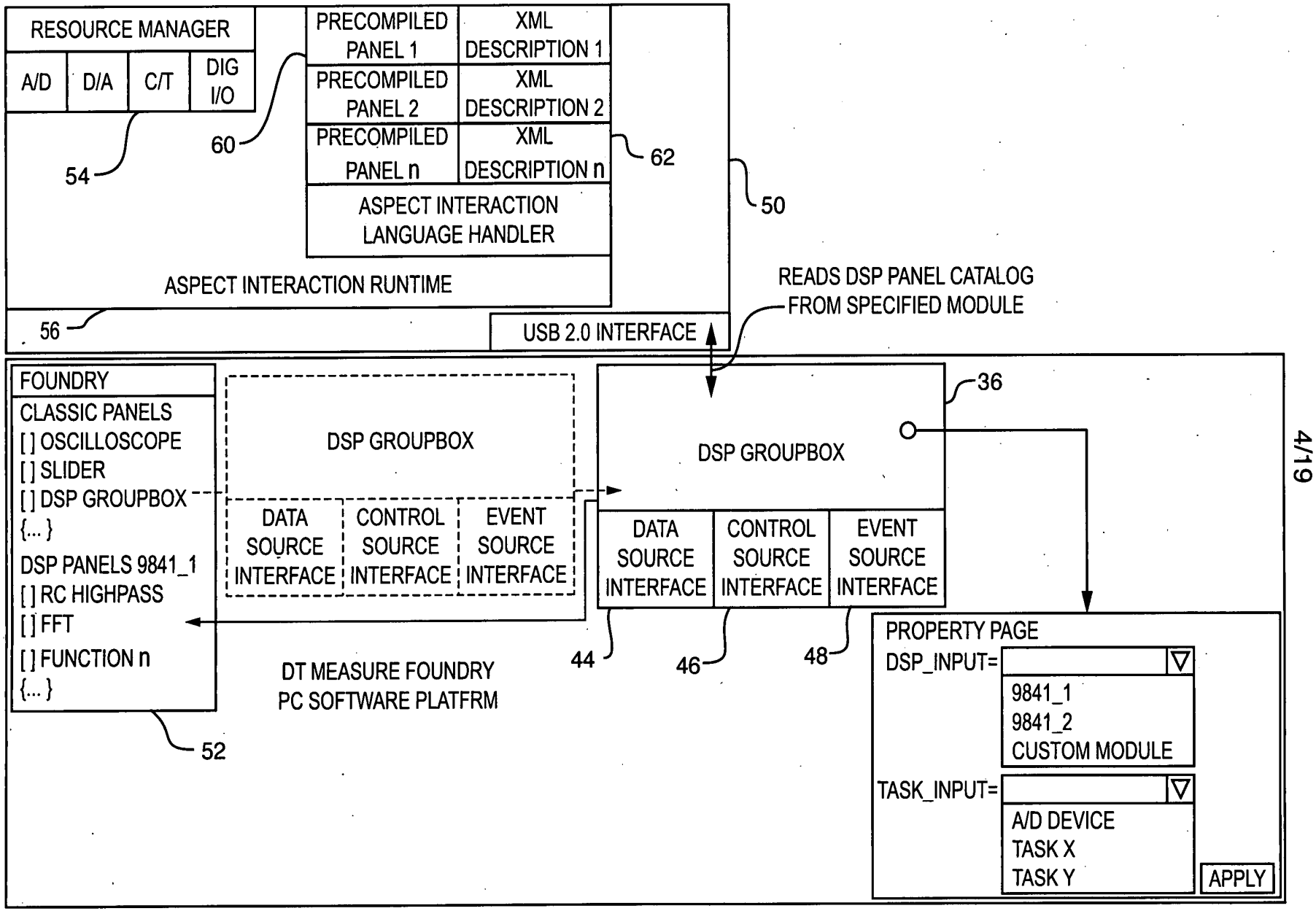

RESOURCE MANAGER
A/D
D/A
C/T
DIG I/O
54
60
PRECOMPILED PANEL 1
XML DESCRIPTION 1
PRECOMPILED PANEL 2
XML DESCRIPTION 2
PRECOMPILED PANEL n
XML DESCRIPTION n
62
ASPECT INTERACTION LANGUAGE HANDLER
ASPECT INTERACTION RUNTIME
50
56
USB 2.0 INTERFACE
READS DSP PANEL CATALOG FROM SPECIFIED MODULE
FOUNDRY
CLASSIC PANELS
[ ] OSCILLOSCOPE
[ ] SLIDER
[ ] DSP GROUPBOX
{... }
DSP PANELS 9841_1
[ ] RC HIGHPASS
[ ] FFT
[ ] FUNCTION n
{... }
52
DSP GROUPBOX
DATA SOURCE INTERFACE
CONTROL SOURCE INTERFACE
EVENT SOURCE INTERFACE
DSP GROUPBOX
36
DATA SOURCE INTERFACE
CONTROL SOURCE INTERFACE
EVENT SOURCE INTERFACE
44
46
48
DT MEASURE FOUNDRY
PC SOFTWARE PLATFRM
PROPERTY PAGE
DSP_INPUT=
9841_1
9841_2
CUSTOM MODULE
TASK_INPUT=
A/D DEVICE
TASK X
TASK Y
APPLY
4/19

FIG. 4

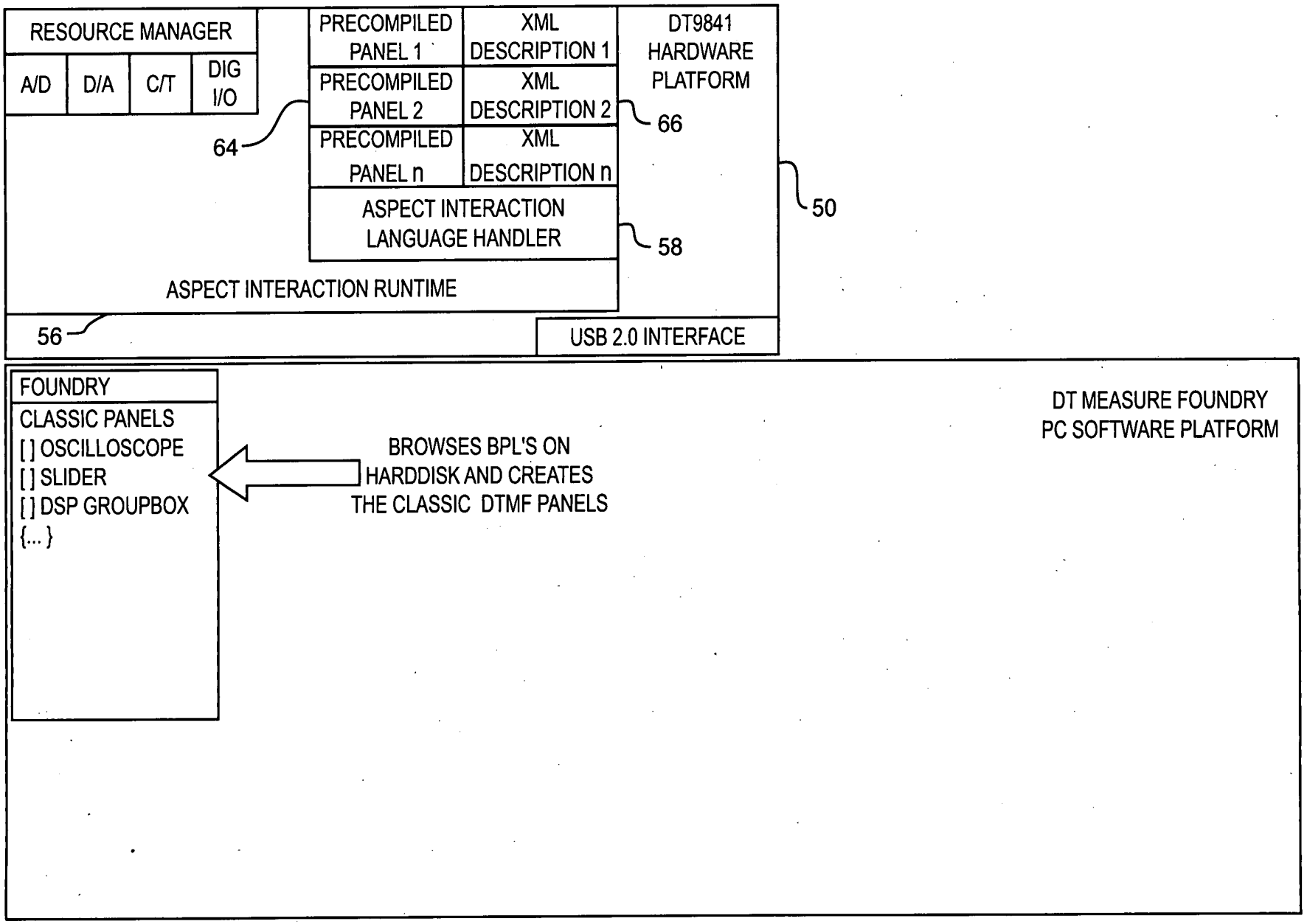

RESOURCE MANAGER
A/D
D/A
C/T
DIG I/O
64
PRECOMPILED PANEL 1
XML DESCRIPTION 1
PRECOMPILED PANEL 2
XML DESCRIPTION 2
66
PRECOMPILED PANEL n
XML DESCRIPTION n
ASPECT INTERACTION LANGUAGE HANDLER
58
DT9841 HARDWARE PLATFORM
50
ASPECT INTERACTION RUNTIME
56
USB 2.0 INTERFACE
FOUNDRY
CLASSIC PANELS
[ ] OSCILLOSCOPE
[ ] SLIDER
[ ] DSP GROUPBOX
{... }
BROWSES BPL'S ON HARDDISK AND CREATES THE CLASSIC DTMF PANELS
DT MEASURE FOUNDRY PC SOFTWARE PLATFORM

FIG. 5

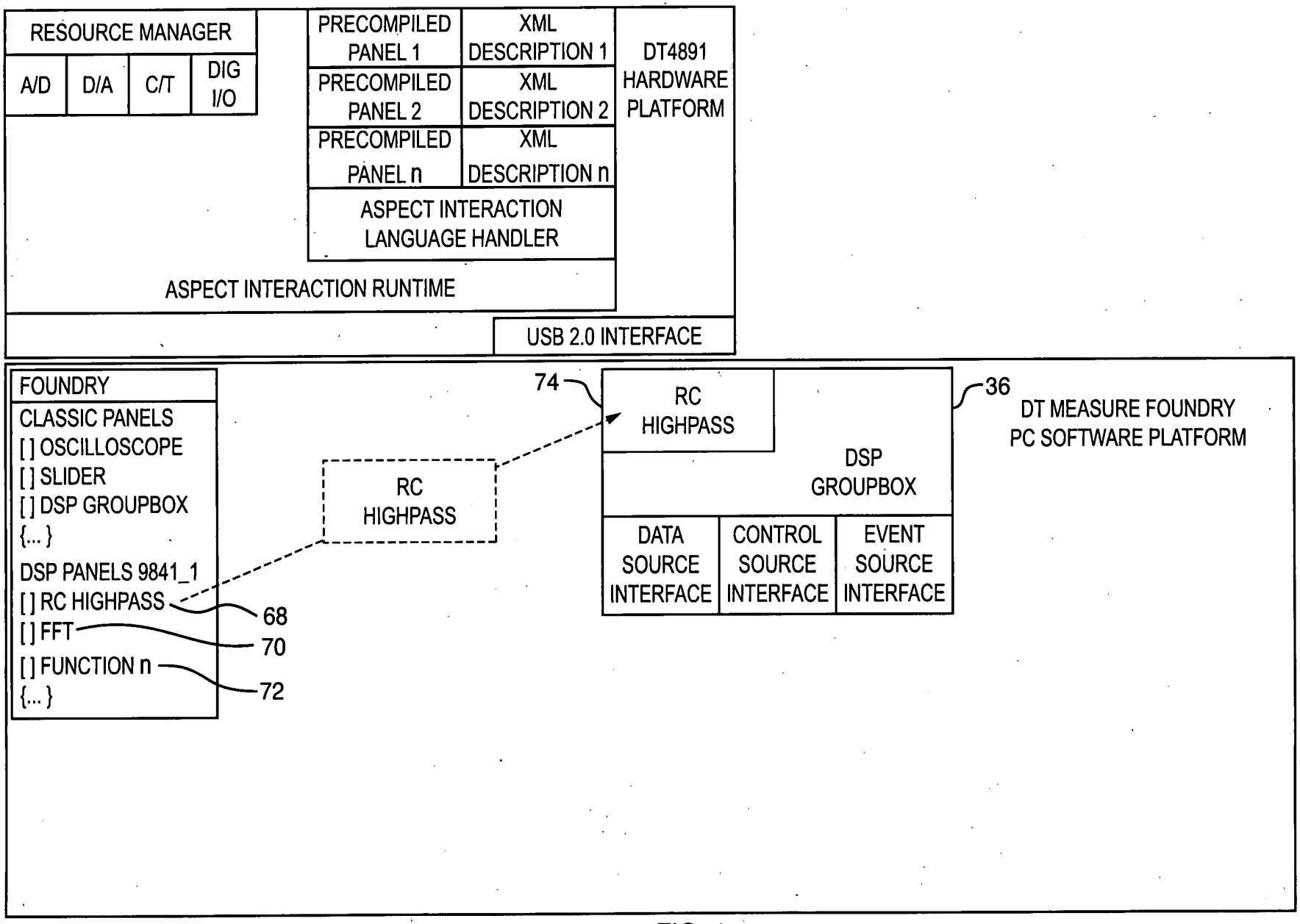

RESOURCE MANAGER
A/D
D/A
C/T
DIG I/O
PRECOMPILED PANEL 1
XML DESCRIPTION 1
PRECOMPILED PANEL 2
XML DESCRIPTION 2
PRECOMPILED PANEL n
XML DESCRIPTION n
ASPECT INTERACTION LANGUAGE HANDLER
ASPECT INTERACTION RUNTIME
DT4891 HARDWARE PLATFORM
USB 2.0 INTERFACE
FOUNDRY
CLASSIC PANELS
[ ] OSCILLOSCOPE
[ ] SLIDER
[ ] DSP GROUPBOX
{... }
DSP PANELS 9841_1
[ ] RC HIGHPASS
[ ] FFT
[ ] FUNCTION n
{... }
68
70
72
74
RC HIGHPASS
RC HIGHPASS
DSP GROUPBOX
DATA SOURCE INTERFACE
CONTROL SOURCE INTERFACE
EVENT SOURCE INTERFACE
36
DT MEASURE FOUNDRY PC SOFTWARE PLATFORM

FIG. 6

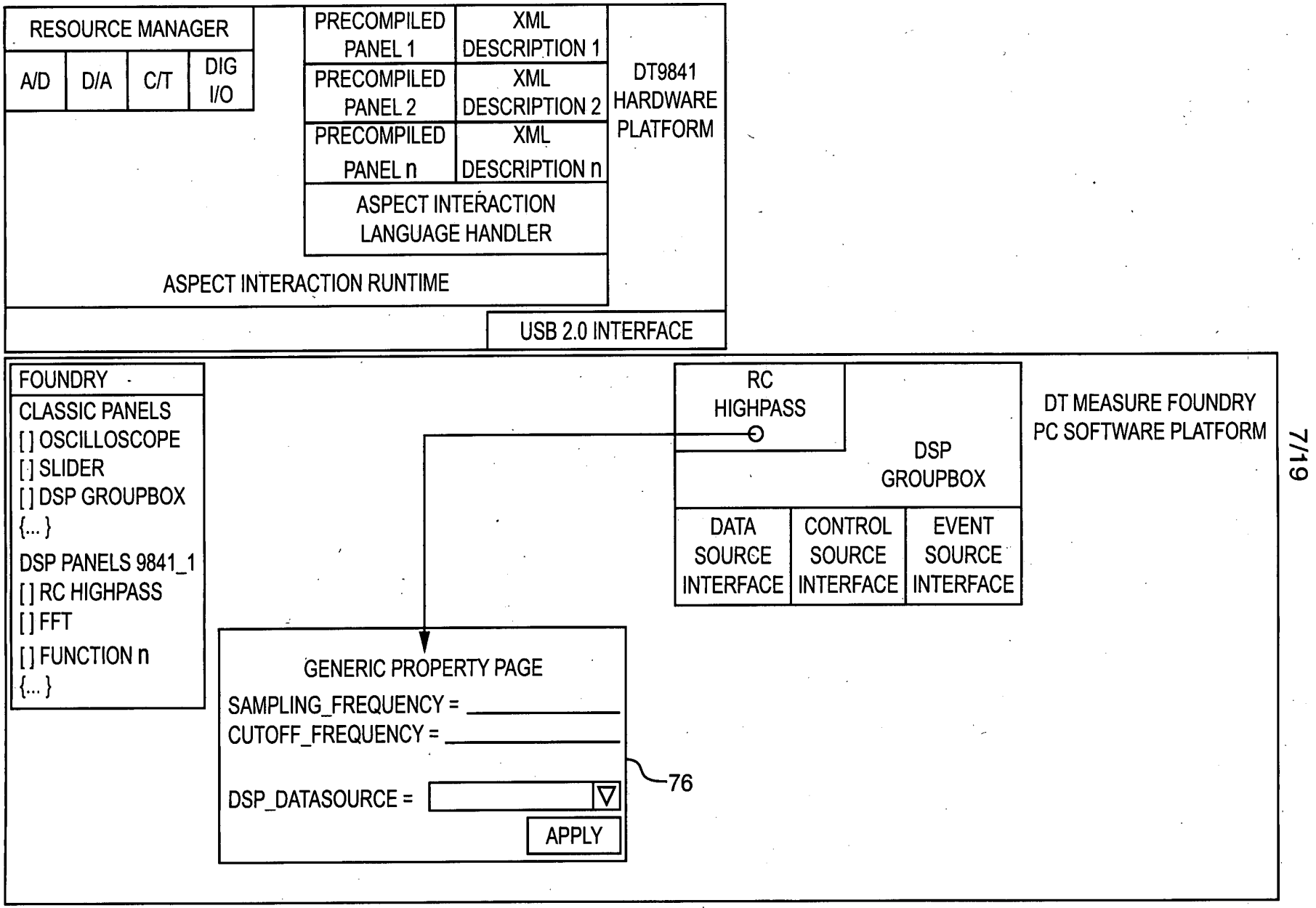

RESOURCE MANAGER
A/D
D/A
C/T
DIG I/O
PRECOMPILED PANEL 1
XML DESCRIPTION 1
PRECOMPILED PANEL 2
XML DESCRIPTION 2
PRECOMPILED PANEL n
XML DESCRIPTION n
ASPECT INTERACTION LANGUAGE HANDLER
ASPECT INTERACTION RUNTIME
DT9841 HARDWARE PLATFORM
USB 2.0 INTERFACE
FOUNDRY
CLASSIC PANELS
[ ] OSCILLOSCOPE
[ ] SLIDER
[ ] DSP GROUPBOX
{... }
DSP PANELS 9841_1
[ ] RC HIGHPASS
[ ] FFT
[ ] FUNCTION n
{... }
RC HIGHPASS
DSP GROUPBOX
DATA SOURCE INTERFACE
CONTROL SOURCE INTERFACE
EVENT SOURCE INTERFACE
DT MEASURE FOUNDRY PC SOFTWARE PLATFORM
GENERIC PROPERTY PAGE
SAMPLING_FREQUENCY =
CUTOFF_FREQUENCY =
DSP_DATASOURCE =
APPLY
76

FIG. 7

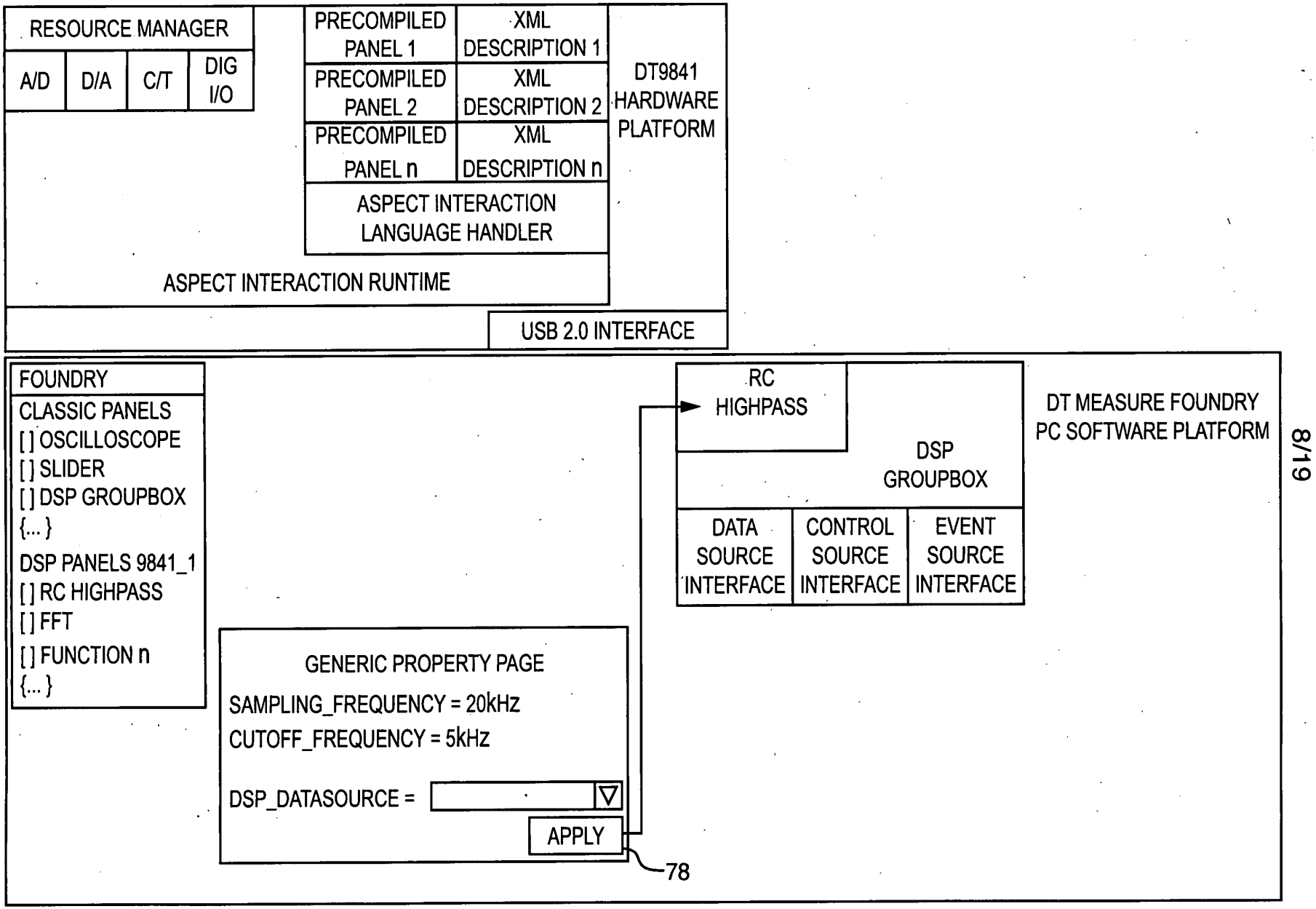

RESOURCE MANAGER
A/D
D/A
C/T
DIG I/O
PRECOMPILED PANEL 1
XML DESCRIPTION 1
PRECOMPILED PANEL 2
XML DESCRIPTION 2
PRECOMPILED PANEL n
XML DESCRIPTION n
ASPECT INTERACTION LANGUAGE HANDLER
ASPECT INTERACTION RUNTIME
DT9841 HARDWARE PLATFORM
USB 2.0 INTERFACE
FOUNDRY
CLASSIC PANELS
[ ] OSCILLOSCOPE
[ ] SLIDER
[ ] DSP GROUPBOX
{... }
DSP PANELS 9841_1
[ ] RC HIGHPASS
[ ] FFT
[ ] FUNCTION n
{... }
GENERIC PROPERTY PAGE
SAMPLING_FREQUENCY = 20kHz
CUTOFF_FREQUENCY = 5kHz
DSP_DATASOURCE =
APPLY
78
RC HIGHPASS
DSP GROUPBOX
DATA SOURCE INTERFACE
CONTROL SOURCE INTERFACE
EVENT SOURCE INTERFACE
DT MEASURE FOUNDRY PC SOFTWARE PLATFORM

FIG. 8

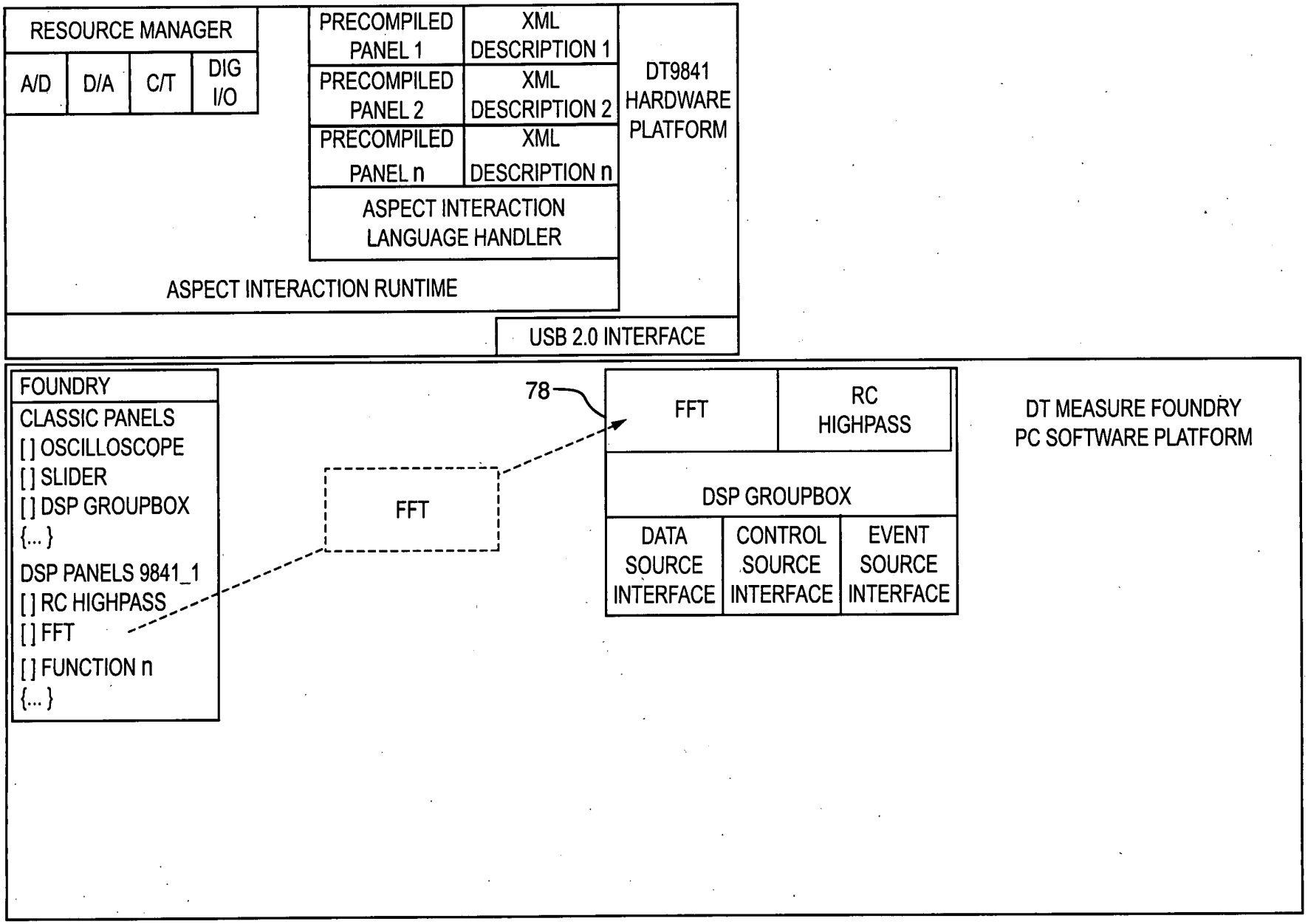

RESOURCE MANAGER
A/D
D/A
C/T
DIG I/O
PRECOMPILED PANEL 1
XML DESCRIPTION 1
PRECOMPILED PANEL 2
XML DESCRIPTION 2
PRECOMPILED PANEL n
XML DESCRIPTION n
ASPECT INTERACTION LANGUAGE HANDLER
ASPECT INTERACTION RUNTIME
DT9841 HARDWARE PLATFORM
USB 2.0 INTERFACE
FOUNDRY
CLASSIC PANELS
[ ] OSCILLOSCOPE
[ ] SLIDER
[ ] DSP GROUPBOX
{... }
DSP PANELS 9841_1
[ ] RC HIGHPASS
[ ] FFT
[ ] FUNCTION n
{... }
FFT
78
FFT
RC HIGHPASS
DSP GROUPBOX
DATA SOURCE INTERFACE
CONTROL SOURCE INTERFACE
EVENT SOURCE INTERFACE
DT MEASURE FOUNDRY PC SOFTWARE PLATFORM

FIG. 9

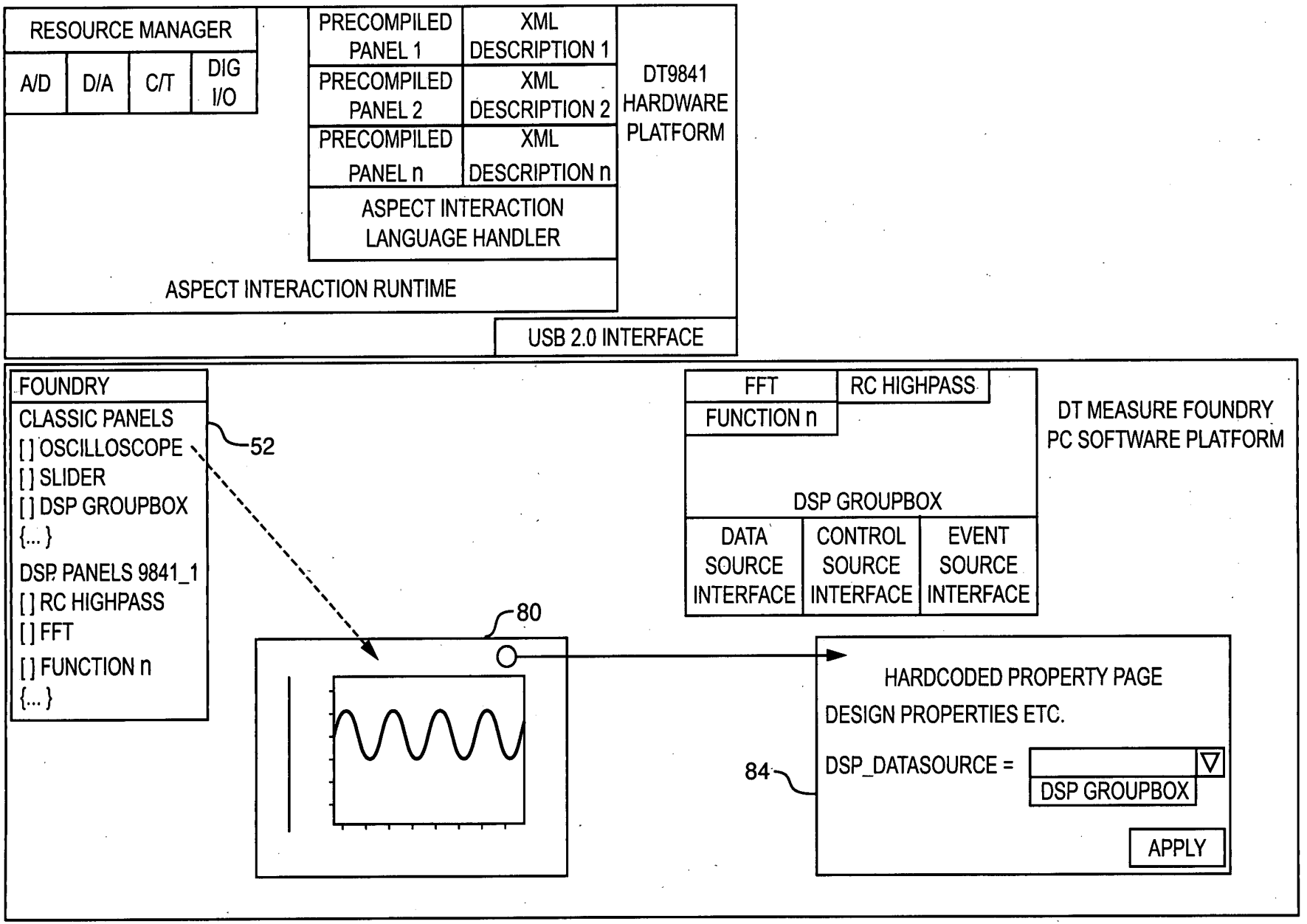

RESOURCE MANAGER
A/D
D/A
C/T
DIG I/O
PRECOMPILED PANEL 1
XML DESCRIPTION 1
PRECOMPILED PANEL 2
XML DESCRIPTION 2
PRECOMPILED PANEL n
XML DESCRIPTION n
ASPECT INTERACTION LANGUAGE HANDLER
ASPECT INTERACTION RUNTIME
DT9841 HARDWARE PLATFORM
USB 2.0 INTERFACE
FOUNDRY
CLASSIC PANELS
[ ] OSCILLOSCOPE
[ ] SLIDER
[ ] DSP GROUPBOX
{... }
DSP PANELS 9841_1
[ ] RC HIGHPASS
[ ] FFT
[ ] FUNCTION n
{... }
52
FFT
RC HIGHPASS
FUNCTION n
DSP GROUPBOX
DATA SOURCE INTERFACE
CONTROL SOURCE INTERFACE
EVENT SOURCE INTERFACE
DT MEASURE FOUNDRY PC SOFTWARE PLATFORM
80
HARDCODED PROPERTY PAGE
DESIGN PROPERTIES ETC.
84
DSP_DATASOURCE =
DSP GROUPBOX
APPLY

FIG. 10

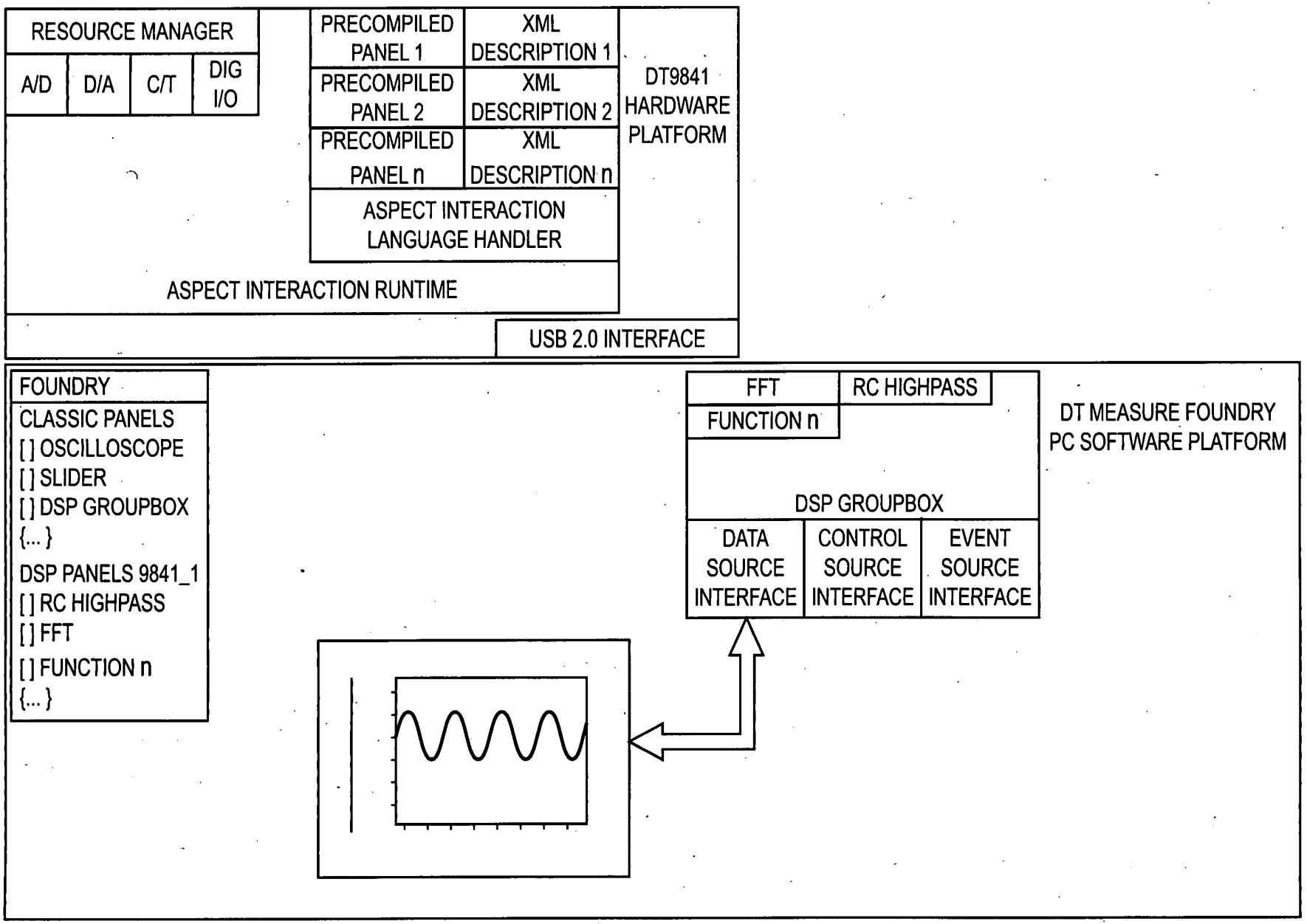

RESOURCE MANAGER
A/D
D/A
C/T
DIG I/O
PRECOMPILED PANEL 1
XML DESCRIPTION 1
PRECOMPILED PANEL 2
XML DESCRIPTION 2
PRECOMPILED PANEL n
XML DESCRIPTION n
ASPECT INTERACTION LANGUAGE HANDLER
ASPECT INTERACTION RUNTIME
DT9841 HARDWARE PLATFORM
USB 2.0 INTERFACE
FOUNDRY
CLASSIC PANELS
[ ] OSCILLOSCOPE
[ ] SLIDER
[ ] DSP GROUPBOX
{... }
DSP PANELS 9841_1
[ ] RC HIGHPASS
[ ] FFT
[ ] FUNCTION n
{... }
FFT
RC HIGHPASS
FUNCTION n
DSP GROUPBOX
DATA SOURCE INTERFACE
CONTROL SOURCE INTERFACE
EVENT SOURCE INTERFACE
DT MEASURE FOUNDRY PC SOFTWARE PLATFORM

FIG. 11

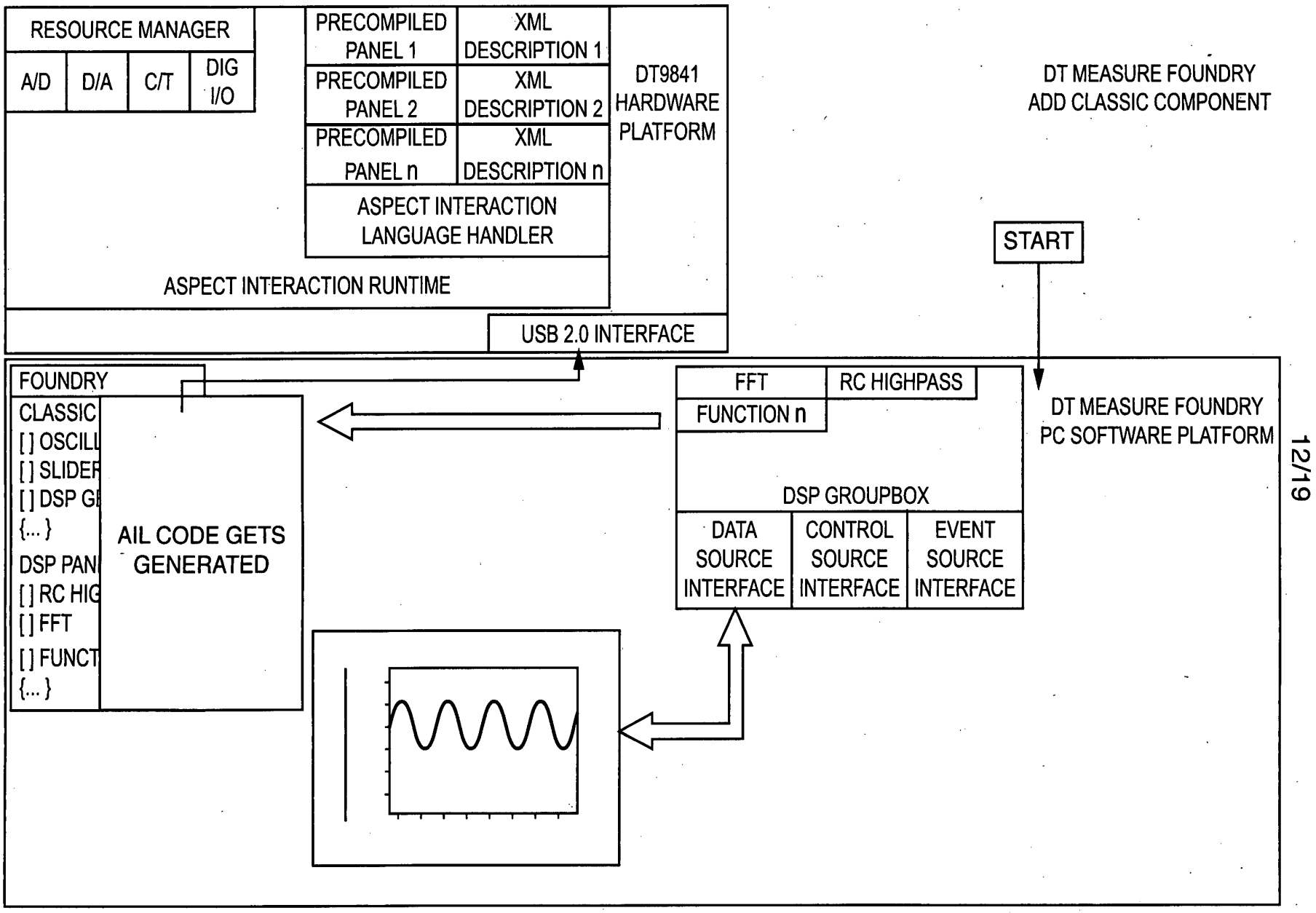
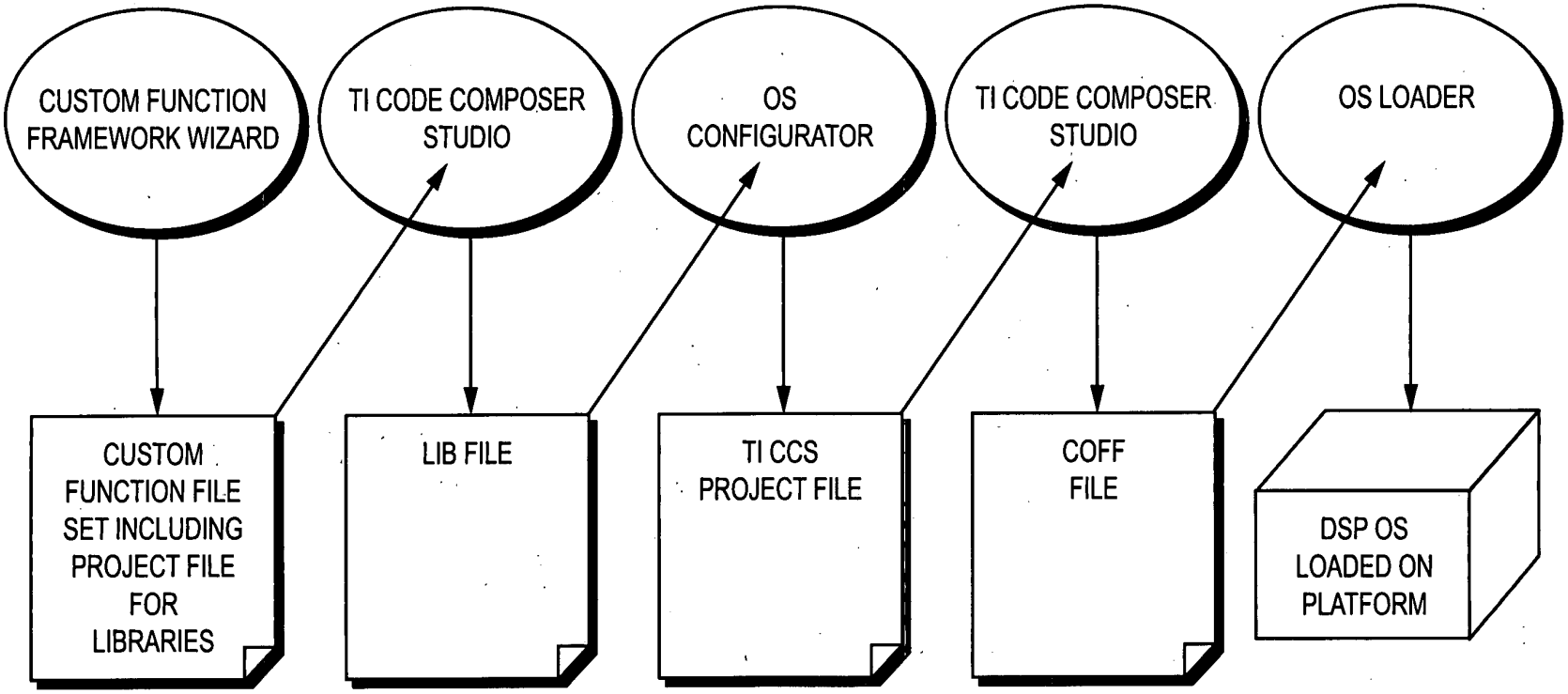

RESOURCE MANAGER
A/D
D/A
C/T
DIG I/O
PRECOMPILED PANEL 1
XML DESCRIPTION 1
PRECOMPILED PANEL 2
XML DESCRIPTION 2
PRECOMPILED PANEL n
XML DESCRIPTION n
ASPECT INTERACTION LANGUAGE HANDLER
ASPECT INTERACTION RUNTIME
DT9841 HARDWARE PLATFORM
USB 2.0 INTERFACE
DT MEASURE FOUNDRY ADD CLASSIC COMPONENT
START
FOUNDRY
CLASSIC
[ ] OSCILL
[ ] SLIDER
[ ] DSP GE
{... }
DSP PAN
[ ] RC HIG
[ ] FFT
[ ] FUNCT
{... }
AIL CODE GETS GENERATED
FFT
RC HIGHPASS
FUNCTION n
DSP GROUPBOX
DATA SOURCE INTERFACE
CONTROL SOURCE INTERFACE
EVENT SOURCE INTERFACE
DT MEASURE FOUNDRY PC SOFTWARE PLATFORM
12/19

FIG. 12



- 5 STEPS ARE NECESSARY TO BUILD A CUSTOM 9841 OPERATING SYSTEM
- EACH STEP CAN BE DONE MANUALLY OR BY USING WIZARDS

FIG. 13

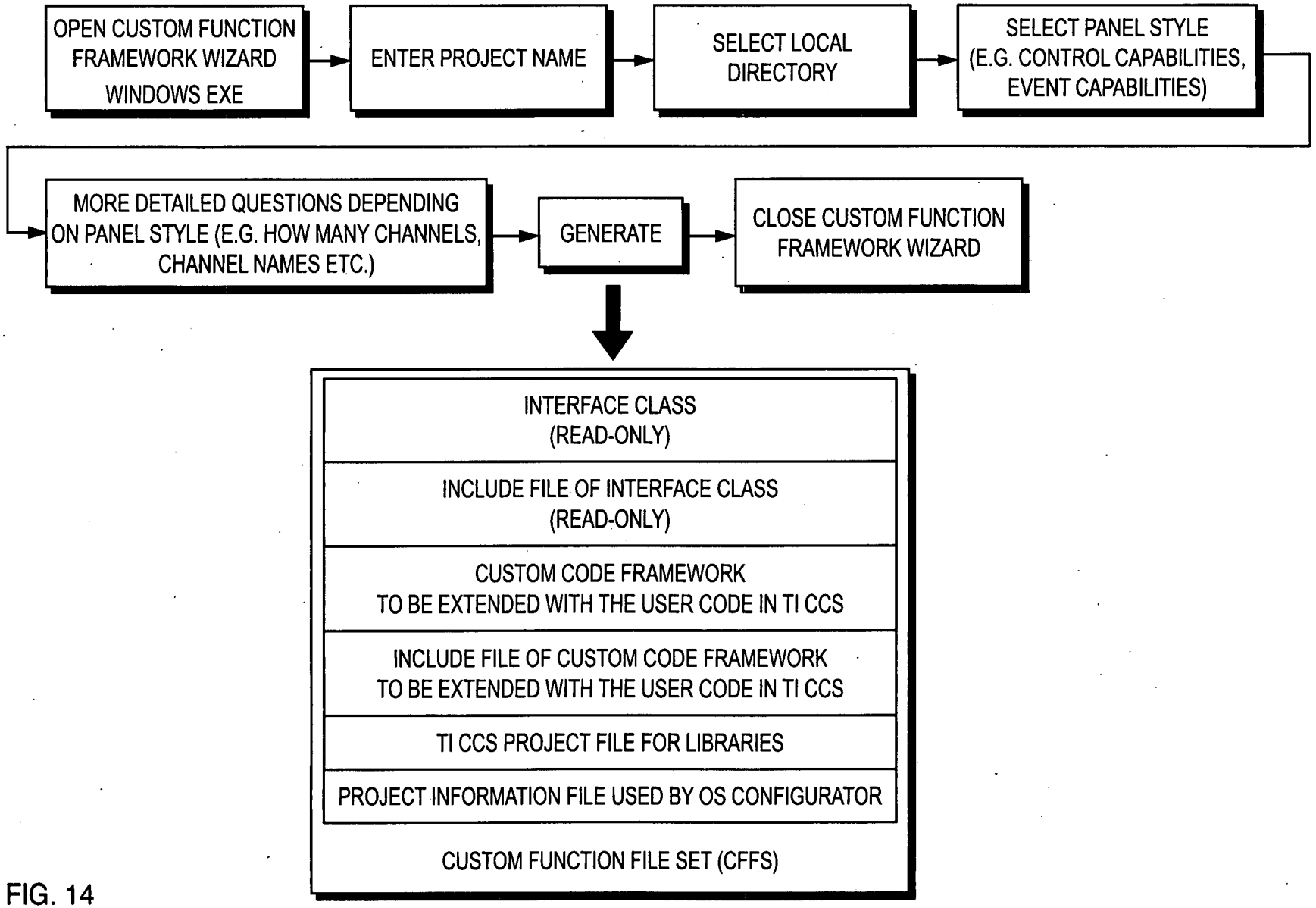

OPEN CUSTOM FUNCTION FRAMEWORK WIZARD WINDOWS EXE
ENTER PROJECT NAME
SELECT LOCAL DIRECTORY
SELECT PANEL STYLE (E.G. CONTROL CAPABILITIES, EVENT CAPABILITIES)
MORE DETAILED QUESTIONS DEPENDING ON PANEL STYLE (E.G. HOW MANY CHANNELS, CHANNEL NAMES ETC.)
GENERATE
CLOSE CUSTOM FUNCTION FRAMEWORK WIZARD
INTERFACE CLASS (READ-ONLY)
INCLUDE FILE OF INTERFACE CLASS (READ-ONLY)
CUSTOM CODE FRAMEWORK TO BE EXTENDED WITH THE USER CODE IN TI CCS
INCLUDE FILE OF CUSTOM CODE FRAMEWORK TO BE EXTENDED WITH THE USER CODE IN TI CCS
TI CCS PROJECT FILE FOR LIBRARIES
PROJECT INFORMATION FILE USED BY OS CONFIGURATOR
CUSTOM FUNCTION FILE SET (CFFS)

FIG. 14

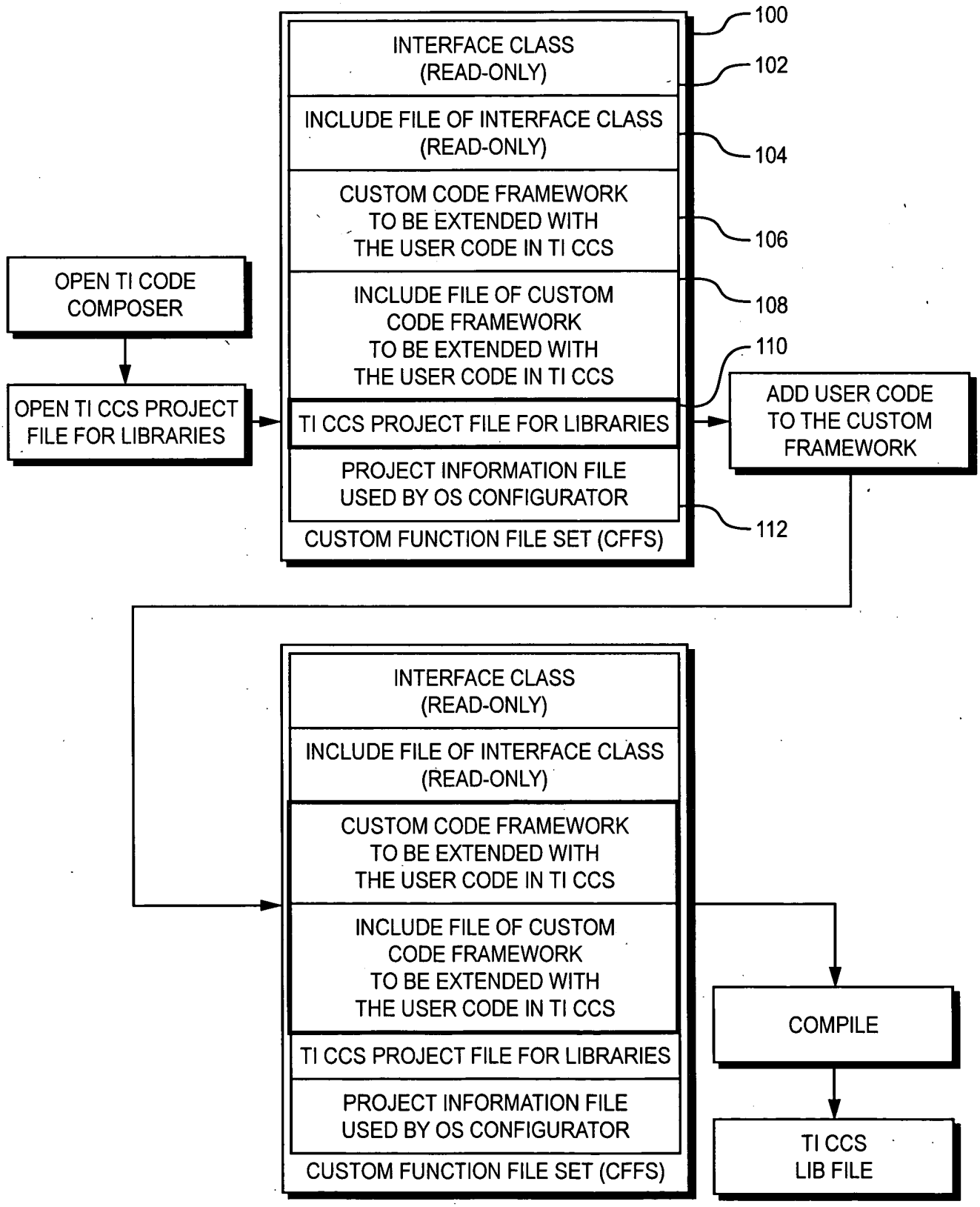

INTERFACE CLASS
(READ-ONLY)
INCLUDE FILE OF INTERFACE CLASS
(READ-ONLY)
CUSTOM CODE FRAMEWORK
TO BE EXTENDED WITH
THE USER CODE IN TI CCS
INCLUDE FILE OF CUSTOM
CODE FRAMEWORK
TO BE EXTENDED WITH
THE USER CODE IN TI CCS
TI CCS PROJECT FILE FOR LIBRARIES
PROJECT INFORMATION FILE
USED BY OS CONFIGURATOR
CUSTOM FUNCTION FILE SET (CFFS)
100
102
104
106
108
110
112
OPEN TI CODE
COMPOSER
OPEN TI CCS PROJECT
FILE FOR LIBRARIES
ADD USER CODE
TO THE CUSTOM
FRAMEWORK
INTERFACE CLASS
(READ-ONLY)
INCLUDE FILE OF INTERFACE CLASS
(READ-ONLY)
CUSTOM CODE FRAMEWORK
TO BE EXTENDED WITH
THE USER CODE IN TI CCS
INCLUDE FILE OF CUSTOM
CODE FRAMEWORK
TO BE EXTENDED WITH
THE USER CODE IN TI CCS
TI CCS PROJECT FILE FOR LIBRARIES
PROJECT INFORMATION FILE
USED BY OS CONFIGURATOR
CUSTOM FUNCTION FILE SET (CFFS)
COMPILE
TI CCS
LIB FILE

FIG. 15

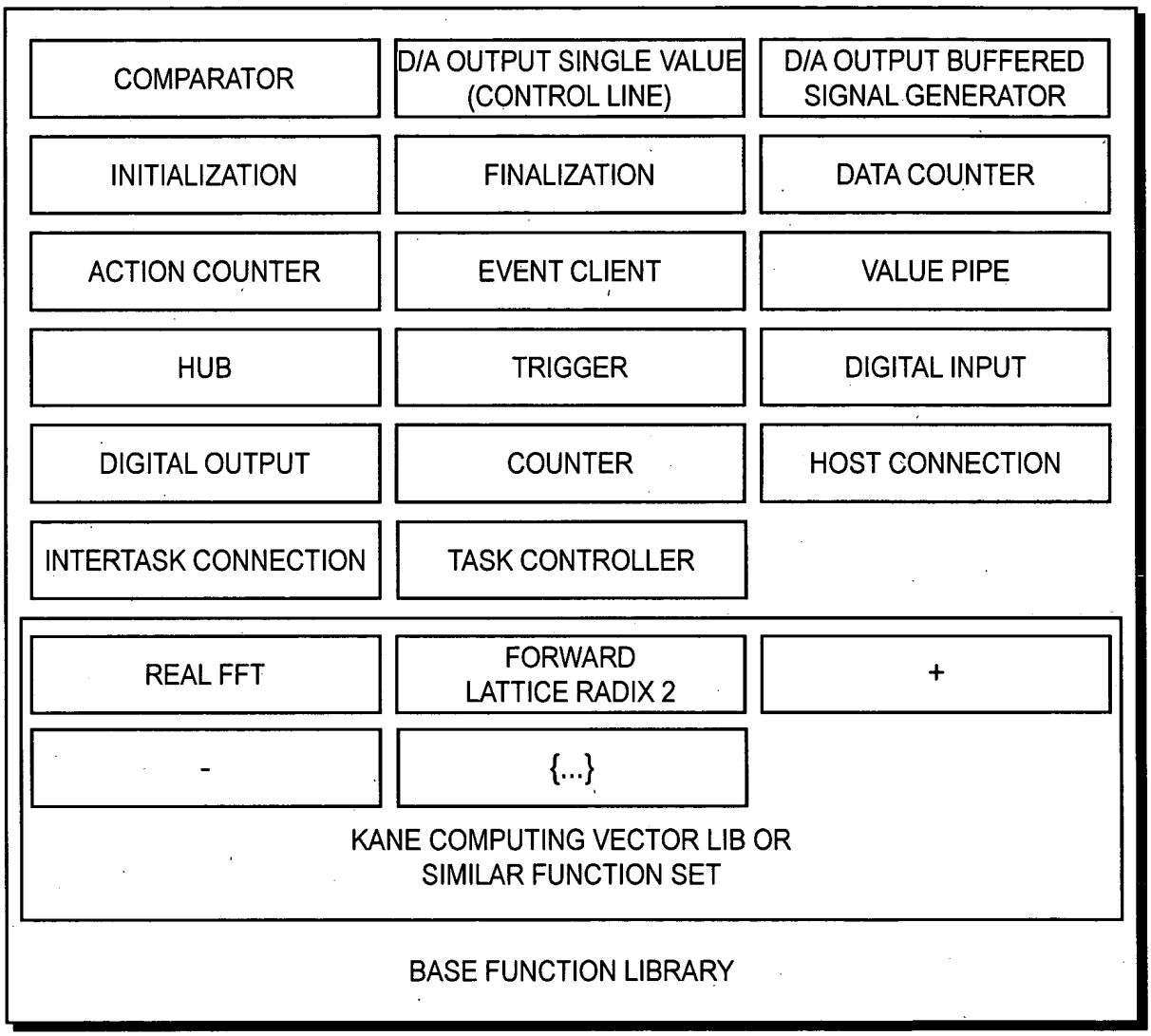

COMPARATOR
D/A OUTPUT SINGLE VALUE (CONTROL LINE)
D/A OUTPUT BUFFERED SIGNAL GENERATOR
INITIALIZATION
FINALIZATION
DATA COUNTER
ACTION COUNTER
EVENT CLIENT
VALUE PIPE
HUB
TRIGGER
DIGITAL INPUT
DIGITAL OUTPUT
COUNTER
HOST CONNECTION
INTERTASK CONNECTION
TASK CONTROLLER
REAL FFT
FORWARD LATTICE RADIX 2
+
-
{...}
KANE COMPUTING VECTOR LIB OR SIMILAR FUNCTION SET
BASE FUNCTION LIBRARY

FIG. 16

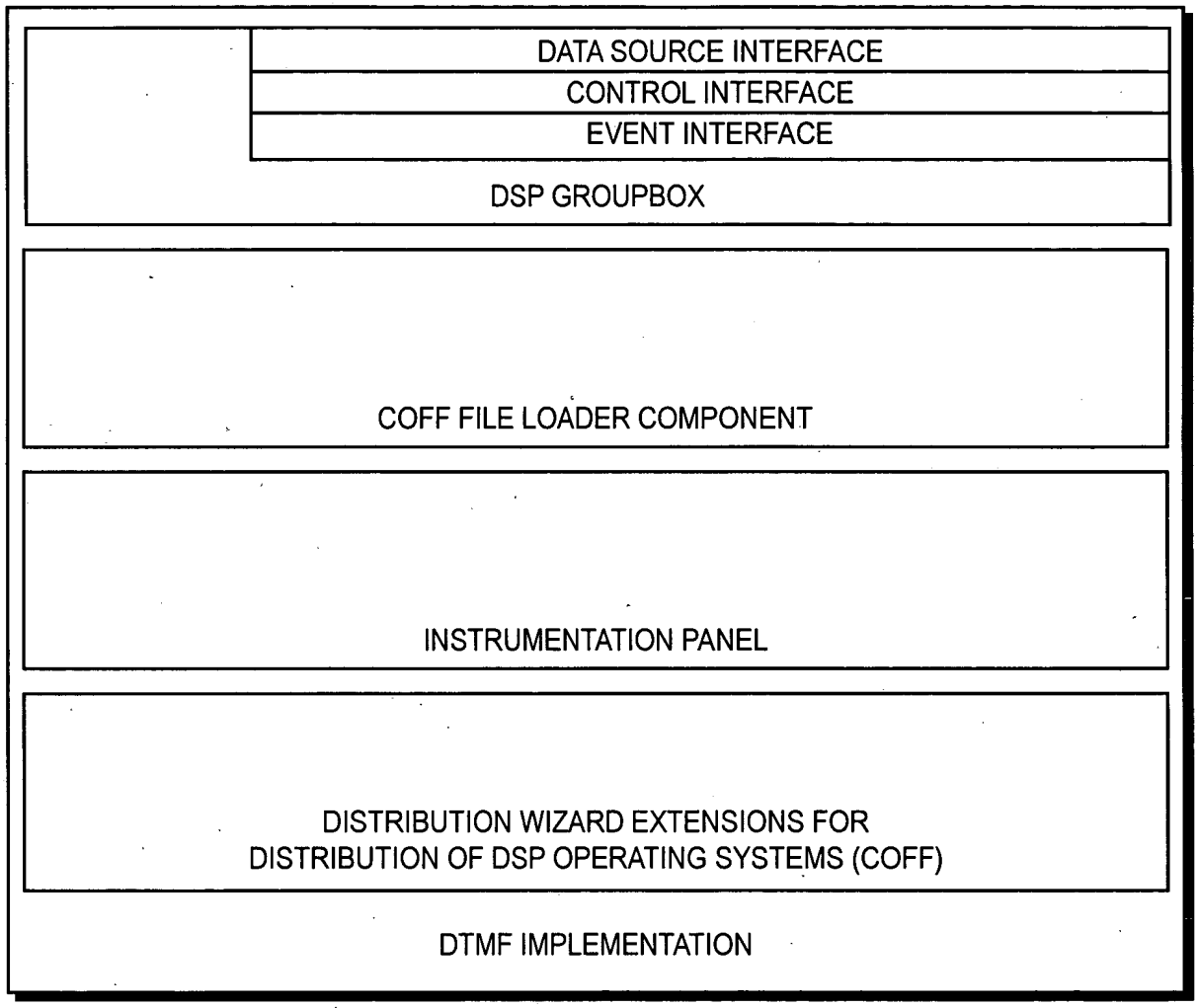

DATA SOURCE INTERFACE
CONTROL INTERFACE
EVENT INTERFACE
DSP GROUPBOX
COFF FILE LOADER COMPONENT
INSTRUMENTATION PANEL
DISTRIBUTION WIZARD EXTENSIONS FOR
DISTRIBUTION OF DSP OPERATING SYSTEMS (COFF)
DTMF IMPLEMENTATION

FIG. 17

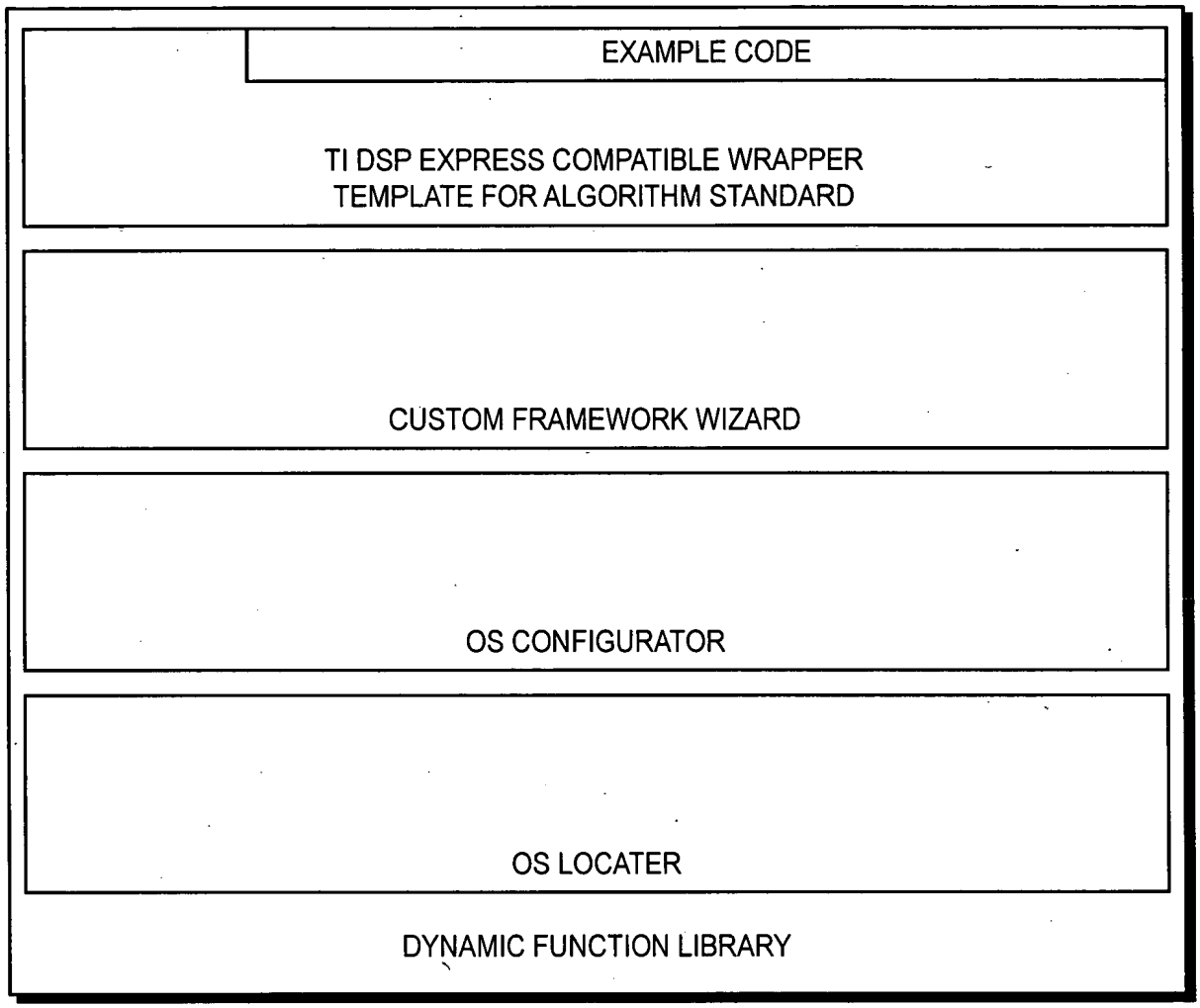

EXAMPLE CODE
TI DSP EXPRESS COMPATIBLE WRAPPER TEMPLATE FOR ALGORITHM STANDARD
CUSTOM FRAMEWORK WIZARD
OS CONFIGURATOR
OS LOCATER
DYNAMIC FUNCTION LIBRARY

FIG. 18

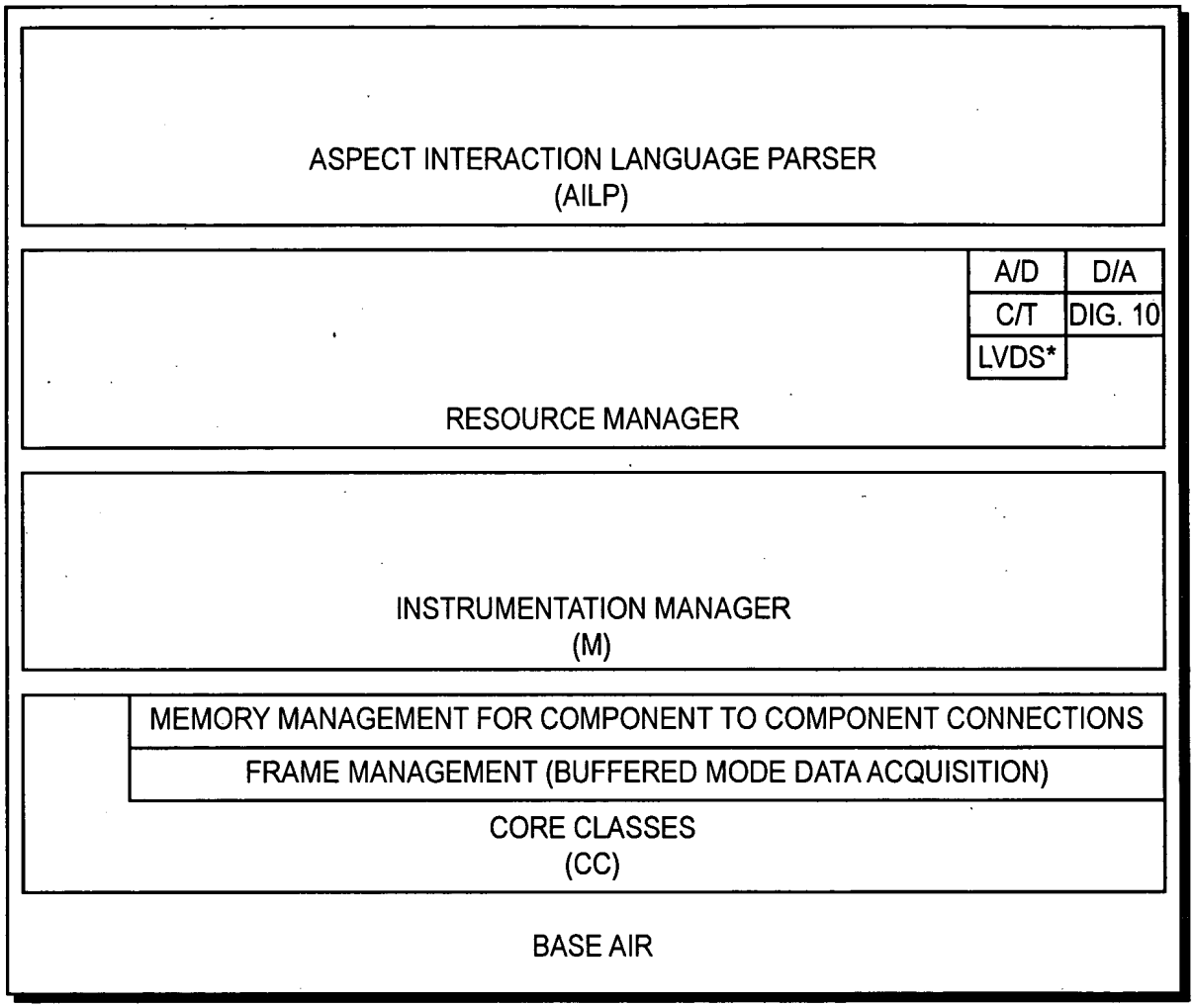

ASPECT INTERACTION LANGUAGE PARSER
(AILP)
A/D
D/A
C/T
DIG. 10
LVDS*
RESOURCE MANAGER
INSTRUMENTATION MANAGER
(M)
MEMORY MANAGEMENT FOR COMPONENT TO COMPONENT CONNECTIONS
FRAME MANAGEMENT (BUFFERED MODE DATA ACQUISITION)
CORE CLASSES
(CC)
BASE AIR

FIG. 19